

## CLAIMS

1. A feeding chamber device **characterized in** that

the feeding chamber has at least one inlet for receiving dry powder from a bulk powder source and at least one outlet for dispensing the powder to a dose filling tool;

during steady state conditions the feeding chamber device is intermittently replenished from the bulk powder source and contains a generally constant but limited amount of powder representing a limited number of doses;

the feeding chamber device constitutes an independent, intermediate device, separating the bulk powder source from the dose filling tool and produces a plug flow of powder from the at least one inlet to the at least one outlet; and

the feeding chamber device produces during steady state conditions a constant degree of segregation of small powder particles from larger powder particles going from the at least one inlet to the at least one outlet.

2. The feeding chamber device according to claim 1, **characterized in** that

the feeding chamber device comprises at least one energizable member, when energized capable of collapsing a body of powder in the feeding chamber device into a homogeneous body of powder and separating the body of powder from having contact with the inner surface of the feeding chamber device.

3. The energizable member according to claim 3, **characterized in** that

the energizable member comprises at least one scraper member movable relative the feeding chamber.

4. An apparatus for volumetric production of doses of dry powder, the apparatus is **characterized in** that

a bulk powder source containing the powder and comprising means for releasing portions of the powder;

a feeding chamber device producing a plug flow of powder from at least one inlet to at least one outlet, the at least one inlet being adapted for receiving portions of the powder from the means for releasing;

a filling tool comprising a at least one powder metering receptacle, the filling tool and the at least one outlet of the feeding chamber device being movable in relation to each other, such that the at least one outlet crosses the at least one metering receptacle, the at least one outlet of the feeding chamber device being forcibly in contact with a surface of the filling tool during the relative movement; and

air suction means adapted for applying air suction power to fill the at least one metering receptacle with a dose of the powder when the at least one outlet of the feeding chamber device crosses the at least one metering receptacle,

wherein the feeding chamber device constitutes an independent, intermediate device, separating the bulk powder source from the filling tool.

5. The apparatus according to claim 4, **characterized in** that the surface of the filling tool comprising the at least one powder metering receptacle is plane.

6. The apparatus according to claim 4, **characterized in** that a filter is applied to the receptacle such that powder particles are not lost to air being sucked during filling of the receptacle.

7. The apparatus according to claim 6, **characterized in** that the filter is a woven filter.

8. The apparatus according to claim 4, **characterized in** that the mechanical strength of the filter is re-enforced by arranging at least one of a

supporting wire netting at one or optionally both sides of the filter or a supporting sintered filter at one or optionally both sides of the filter.

9. The apparatus according to claim 4, **characterized in** that a spring force is applied to keep contact pressure between an air nozzle, the filter and an opening of the receptacle for sucking air, such that elastic seals sealing nozzle, filter and receptacle will stop leakage of air and powder into and out of the receptacle.

10. The apparatus according to claim 4, **characterized in** that a source of electric charges is arranged in an air gap between the filling tool and a dose container, such that electrically charged particles in an ejected powder load become electrically neutralized while being transferred from receptacle to container.

11. The apparatus according to claim 4, **characterized in** that sources of electric charges are arranged at a working distance to the bulk powder source and optionally at a working distance to the powder in the feeding chamber and to the filling tool in order to electrically neutralize electrostatic charges of the powder and the apparatus.

12. A method of controlling particle segregation in a dry powder during volumetric filling of metered doses, **characterized by:**

arranging a feeding chamber device having at least one inlet for receiving dry powder from a bulk powder source and at least one outlet for dispensing powder to a filling tool, the feeding chamber device containing a limited amount of powder representing a limited number of doses;

replenishing intermittently during a filling operation the feeding chamber device from the bulk powder source, and

arranging the feeding chamber device to be an independent, intermediate device, separating the bulk powder source from the filling tool,

producing a plug flow of powder from the at least one inlet to the at least one outlet;

wherein in steady state conditions, a constant degree of segregation of small powder particles from larger powder particles going from the at least one inlet to the at least one outlet of the feeding chamber device is produced.

13. The method according to claim 12, **characterized by** the further step of

selecting a mass target of the doses of a chosen powder to be in a range 100  $\mu$ g - 50 mg and preferably in a range 100  $\mu$ g - 10 mg and most preferably in a range 100  $\mu$ g - 5 mg.

14. The method according to claim 12, **characterized by** the further step of

arranging at least one energizable member in the feeding chamber device, when energized capable of collapsing a body of powder in the feeding chamber device into a homogeneous body of powder and separating the body of powder from having contact with the inner surface of the feeding chamber device.

15. The method according to claim 12, **characterized by** the further step of

selecting the energizable member to comprise at least one scraper member movable relative the inside of the feeding chamber.

16. A method of producing volumetric doses of dry powder, **characterized by:**

intermittently replenishing a limited amount of powder representing a limited number of doses from a bulk powder source to at least one inlet of a feeding chamber device;

providing a relative movement between the feeding chamber device and a filling tool comprising a powder metering receptacle such that at least

one outlet of the feeding chamber device crosses the metering receptacle in such a way that the at least one outlet is in forcible contact with a surface of the filling tool; and

5       applying air suction power to fill the metering receptacle with a dose of the powder when the at least one outlet of the feeding chamber device crosses the metering receptacle,

      wherein feeding chamber device constituting an independent, intermediate device, separating the bulk powder source from the filling tool.

10   17.       The method according to claim 16, **characterized by** the further step of

      arranging the surface of the filling tool comprising the at least one powder metering receptacle to be plane.

15   18.       The method according to claim 16, **characterized by** the further step of

      applying a filter to the receptacle such that powder particles are not lost to air being sucked during filling of the receptacle.

20   19.       The method according to claim 16, **characterized by** the further step of

      re-enforcing the mechanical strength of the filter by arranging at least one of a supporting wire netting at one or optionally both sides of the filter or a supporting sintered filter at one or optionally both sides of the  
25   filter.

      20.       The method according to claim 16, **characterized by** the further step of

      30       applying a spring force to obtain contact pressure between an air nozzle, the filter and an opening of the receptacle for sucking air, such that elastic seals sealing nozzle, filter and receptacle will stop leakage of air and powder into and out of the receptacle.

21. The method according to claim 16, **characterized by** the further step of

5 arranging a source of electric charges in an air gap between the filling tool and a load container, such that electrically charged particles in an ejected powder load become electrically neutralized while being transferred from receptacle to container.

22. The method according to claim 16, **characterized by** the further  
10 step of

arranging sources of electric charges at a working distance to the bulk powder source and optionally at a working distance to the powder in the feeding chamber and to the filling tool in order to accomplish that electrostatic charges of the powder and the apparatus become electrically  
15 neutralized such that the filling process is not adversely affected.

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